



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,742	02/19/2004	Yoshihiro Inaba	118754	1791

25944 7590 09/15/2004

OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320

EXAMINER

BOYKIN, TERRESSA M

ART UNIT	PAPER NUMBER
----------	--------------

1711

DATE MAILED: 09/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/780,742

Applicant(s)

INABA ET AL.

Examiner

Terressa M. Boykin

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2004.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-16 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/04.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**Priority**

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

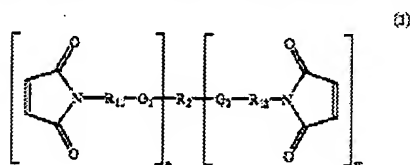
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-16 are rejected under 35 U.S.C. 102(e) as being anticipated by USP 6410611 see tables 2 and 4, cols. 1- 4, 6 , 16 and claims 1 and 4.**

USP 6410611 discloses an active energy ray curable composition comprising a maleimide derivative, which is useful for various coatings, inks for printings, surface finishes, moldings, laminated plates, adhesives, and binders. More specifically, the present invention relates to an active energy ray curable composition comprising a maleimide derivative which can be cured in the absence of a photoinitiator under irradiation of ultraviolet light with practical intensity and energy value of irradiating light, and a method for curing the said curable composition. Unlimited combinations of one or more of any compounds can be used, without being limited to the compounds described hereinbefore, as curable compounds which can be used together in the active energy ray curable composition of the present invention, if the compounds are copolymerizable with maleimide group of the maleimide derivatives which is

Art Unit: 1711

represented by the general formula (1):



wherein m and n each represent an integer of 1 to 5, and the total of m and n is 6 or smaller, R<sub>11</sub> and R<sub>12</sub> each represent a linking group selected from the group consisting of 1 an alkylene group, 2 an alicyclic group, 3 an arylalkylene group, and 4 a cycloalkylalkylene group, G<sub>1</sub> and G<sub>2</sub> each represent an ester linkage selected from the group consisting of --COO-- and --OCO--, R<sub>2</sub> represents a linking chain having an average molecular weight of 100 to 100,000 selected from the group consisting of (A) a (poly)ether linking chain and (B) a (poly)ester linking chain, in which at least one organic group selected from the group consisting of 1 a straight chain alkylene group, 2 a branched alkylene group, 3 an alkylene group having a hydroxyl group, 4 an alicyclic group, 5 an aryl group, and 6 an arylalkylene group is connected via at least one linkage selected from the group consisting of (a) an ether linkage and (b) an ester linkage.

In col. 6 note that the reference discloses Examples of (poly)ether (poly)ol constructing linking chain (a) described above include polyalkylene glycols such as polyethylene glycol, polypropylene glycol, polybutylene glycol, polytetramethylene glycol, and the like; modified alkylene glycols in which ethylene glycol, propanediol, propylene glycol, tetramethylene glycol, pentamethylene glycol, hexanediol, neopentyl dipentaerythritol, and the like are modified by ethylene oxides, propylene oxides,

Art Unit: 1711

butylene oxides, and tetrahydrofuran. Among these (poly)ether (poly)ols, modified alkylene glycols are preferable. In addition, examples of (poly)ether (poly)ol constructing the above linking chain (a) include hydrocarbon polyols such as a copolymer of ethylene oxide and propylene oxide, a copolymer of propylene glycol and tetrahydrofuran, a copolymer of ethylene glycol and tetrahydrofuran, polyisoprene glycol, hydrogenated polyisoprene glycol, polybutadiene glycol, hydrogenated polybutadiene glycol, and the like; polyhydric alcohol compounds such as polytetramethylene hexaglycerin ether (modified hexaglycerin by tetrahydrofuran), and the like. However, there are no particular limitations placed on these (poly)ether (poly)ols etc.

In col. 14 lines 31- 60 the reference discloses examples of hydroxy compounds having at least one acryloyloxy group (A-2-1) include, for example, 2-hydroxyethyl(meth)acrylate, 2-hydroxypropyl(meth)acrylate, 2-hydroxybutyl(meth)acrylate, 3-hydroxybutyl(meth)acrylate, 4-hydroxybutyl(meth)acrylate, cyclohexanedimethanolmono(meth)acrylate, polyethylene glycol(meth)acrylate, polypropylene glycol(meth)acrylate, trimethylolpropanedi(meth)acrylate, trimethylolethanedimethacrylate, pentaerythritoltri(meth)acrylate or an adduct of (meth)acrylate with glycidyl(meth)acrylate, (meth)acrylate compounds having hydroxyl groups such as 2-hydroxy-3-phenolpropyl(meth)acrylate, and ring-opening reaction products of the above acrylate compounds having hydroxyl groups with .epsilon.-caprolactone.

In col. 16 lines 6 through 58 the reference discloses (Poly)ether (meth)acrylates (A-

Art Unit: 1711

4) capable of being used together in the active energy ray curable composition of the present invention include, for example, but are not limited to, monofunctional (poly)ether(meth)acrylates such as butoxyethyl(meth)acrylate, butoxytriethylene glycol(meth)acrylate, epichlorohydrin-modified butyl(meth)acrylate, dicyclopentenylloxylethyl(meth)acrylate, 2-ethoxyethyl(meth)acrylate, ethylcarbitol(meth)acrylate, 2-methoxy(poly)ethylene glycol (meth)acrylate, methoxy(poly)propylene glycol (meth)acrylate, nonylphenoxypolyethylene glycol (meth)acrylate, nonylphenoxypolypropylene glycol (meth)acrylate, phenoxyhydroxypropyl(meth)acrylate, phenoxy(poly)ethylene glycol (meth)acrylate, polyethylene glycol mono(meth)acrylate, polypropylene glycol mono(meth)acrylate, and polyethylene glycol/polypropylene glycol mono(meth)acrylate; alkylene glycol di(meth)acrylates such as polyethylene glycol di(meth)acrylate, polypropylene glycol di(meth)acrylate, polybutylene glycol di(meth)acrylate, polytetramethylene glycol di(meth)acrylate; polyfunctional (meth)acrylates induced by (meth)acrylic acid with aliphatic polyols such as a copolymer of ethylene oxide and propylene oxide, a copolymer of propylene glycol and tetrahydrofuran, a copolymer of ethylene glycol and tetrahydrofuran, polyisoprene glycol, hydrogenated polyisoprene glycol, polybutadieneglycol, hydrogenated polybutadiene glycol; polyfunctional (meth)acrylates induced by acrylic acid with polyhydric alcohols such as polytetramethylenehexaglyceryl ether (tetrahydrofuran-modified hexaglycerin); di(meth)acrylates of diol obtained by addition of equimolar or more than 1 mol of cyclic ethers such as ethylene oxide, propylene oxide, butylene oxide and/or tetrahydrofuran

Art Unit: 1711

to 1 mol of neopentyl oxide; di(meth)acrylates of alkylene oxides-modified bisphenols such as bisphenol A, bisphenol F and bisphenol S; di(meth)acrylate of alkylene oxide-modified hydrogenated bisphenols such as hydrogenated bisphenol A, hydrogenated bisphenol F, hydrogenated bisphenol S; di(meth)acrylates of alkylene oxide-modified trisphenols; di(meth)acrylates of alkylene oxide-modified hydrogenated trisphenols; di(meth)acrylates of alkylene oxide-modified p,p'-bisphenols; di(meth)acrylates of alkylene oxide-modified hydrogenated bisphenols; di(meth)acrylates of alkylene oxide-modified p,p'-dihydroxybenzophenones; mono-, di-, and tri-(meth)acrylates of triols obtained by addition of equimolar or more than 1 mol of ethylene oxide, propylene oxide, butylene oxide, and/or cyclic ethers such as tetrahydrofuran to 1 mol of trimethylolpropane or glycerin.

With regard to claims 5,6,and 7 note the reference discloses with regard to the amounts therein that when a compound having vinyl ether groups is used together in the active energy ray curable composition containing maleimide derivatives of the present invention, there is no limitation on the ratio to be incorporated in the composition. However, it is preferable to use the compound having vinyl ether groups such that 100 parts by weight of the compound having vinyl ether groups constitutes a ratio of equal or more than 5 parts by weight of maleimide derivatives represent by the formula 1, and the use of equimolar amount of vinyl ether group to group is more preferable from points of view of the curing speed and a cured film property. Note also examples herein.

With regard to applicants' claim 10 note that the reference discloses examples of

Art Unit: 1711

(poly)ether (poly)ol constructing linking chain (a) described above include polyalkylene glycols such as polyethylene glycol, polypropylene glycol, polybutylene glycol, polytetramethylene glycol, and the like; modified alkylene glycols which include ethylene glycol and propanediol etc.

With regard to applicants' claim 11 note Manufacturing Example 3 and cols. 16 and 17.

With regard to claims 13 and 14, note the reference discloses the reaction is carried out at a temperature in a range of room temperature to 150 C. using a catalyst. Examples of the catalyst include imidazoles such as 2 methylimidazole and the like; quaternary ammonium salts such as tetramethyl ammonium chloride, trimethylbenzyl ammonium chloride, tetramethyl ammonium bromide, and the like; amines such as trimethylamine, triethylamine, benzylmethylamine, tributylamine, and the like; phosphines such as triphenylphosphine, tricyclohydroxylphosphine and the like; laurates such as dibutyltin laurate, and the like; acid alkali metal salts etc., acetate, potassium tertiary phosphate, sodium acrylate, sodium methacrylate, and the like; alkali alcoholates such as sodium methylate, potassium ethylate, and the like; anion-exchange resins; and the like.

Thus in view of the above, there appears to be no significant difference between the reference and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.




**Correspondence**

Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is ( 571-272-1700). Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tmb



Examiner Terressa Boykin  
Primary Examiner  
Art Unit 1711